THE TEACHING RECOVERY TECHNIQUES INTERVENTION FOR PTSD AMONG WAR-AFFECTED CHILDREN: AN ANALYSIS OF POTENTIAL MEDIATORS AND MODERATORS

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Although a great number of different psychosocial interventions are being carried out all over the world to help children affected by posttraumatic stress symptoms (PTSS) due to war and armed conflict, it is still to a large extent unclear by which mechanisms interventions work when they do and which interventions suit particular children best. Recently, reviewers have called for more research into the specific mechanisms of action of interventions and for extending research into factors moderating their effectiveness.

Modern cognitive theories on PTSD would suggest that reductions in dysfunctional, excessively negative cognitive appraisals about the traumatic event and its sequelae as well as in secondary negative emotions such as guilt would be crucial to alleviating PTSS. This thesis studied the potential mediating roles of such cognitive factors in the effectiveness of a psychosocial group intervention called Teaching Recovery Techniques (TRT), implemented among 482 10–13-year-old Palestinian school children affected by war and armed conflict. The hypotheses were that taking part in the intervention would lead to greater reductions in dysfunctional cognitive appraisals and self-attributions, and that these greater reductions would in turn mediate the intervention's effects on PTSS. The thesis further examined the possible moderating roles of comorbid depression and gender in the intervention's direct and mediated effects.

The results suggest that though the intervention was effective in reducing children's PTSS, reductions in dysfunctional cognitive appraisals or self-attributions did not mediate these effects. In fact, contrary to expectations, children who took part in the intervention saw smaller reductions in dysfunctional cognitive appraisals as compared to a control group. The intervention did have a positive effect on self-attributions, but this in turn was not associated with greater PTSS reduction. As regards moderating factors, it was found that children who were depressed at the start of the intervention benefitted more from the intervention and saw greater reductions in posttraumatic stress symptoms, even as they experienced smaller reductions in dysfunctional appraisals. Gender had no clear moderating effects, but girls experienced less improvement in PTSS in both the intervention and control groups as compared to boys.

The findings of this thesis show that children with comorbid depression, too, can benefit from group interventions such as TRT and may even form a target group for whom such interventions would be particularly effective and useful. They also suggest that negative cognitive appraisals may not be as central to PTSD in children traumatized by war as theory would suggest, at least in contexts similar to the one studied here.

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Psykososiaalisia interventioita käytetään ympäri maailmaa posttraumaattisista stressioireista sodan tai aseellisen konfliktin vuoksi kärsivien lasten auttamiseen, mutta on silti yhä suurelta osin epäselvää, millaisten mekanismien kautta interventiot toimivat ja mitkä interventiot sopivat parhaiten tietyille lapsiryhmille. Katsauksia tehneet tutkijat ovat viime aikoina korostaneet, miten tärkeää olisi tutkia interventioiden varsinaisia toimintamekanismeja ja laajentaa tutkimusta käsittelemään myös interventioiden vaikuttavuutta mahdollisesti moderoivia tekijöitä.

Posttraumaattisen stressioireyhtymän (PTSD) modernien kognitiivisten teorioiden perusteella oletetaan, että toimimattomien, ylinegatiivisten traumaa ja sen seurauksia koskevien kognitiivisten arvioiden sekä toissijaisten tunteiden kuten syyllisyyden väheneminen olisi keskeistä posttraumaattisten stressioireiden lievittymisessä. Tämä tutkielma selvitti tällaisten kognitiivisten tekijöiden mahdollisia välittäjärooleja Teaching Recovery Techniques –nimisen psykososiaalisen intervention vaikuttavuudessa 482 10–13-vuotiaan sodan ja aseellisen konfliktin vaikutuksista kärsivän palestiinalaislapsen joukossa. Hypoteeseina oli, että toimimattomat kognitiiviset arviot ja itsesyytökset vähenisivät enemmän interventioon osallistuneilla, ja että tämä olisi vuorostaan yhteydessä posttraumaattisten stressioireiden parempaan lievittymiseen. Tutkielma selvitti lisäksi samanaikaisen masentuneisuuden sekä sukupuolen mahdollisia moderaatiovaikutuksia intervention suoriin ja välitettyihin vaikutuksiin.

Tulokset osoittavat, että vaikka intervention onnistui lievittää lasten stressioireita, toimimattomien kognitiivisten arvioiden tai itsesyytösten väheneminen ei välittänyt näitä vaikutuksia. Vastoin odotuksia interventioon osallistuneiden lasten toimimattomat kognitiiviset arviot vähenivät päinvastoin vähemmän kuin verrokkiryhmässä. Interventiolla havaittiin positiivisia vaikutuksia itsesyytöksiin, mutta ne eivät olleet selvässä yhteydessä parempaan stressioireiden lievittymiseen. Moderaatiovaikutusten suhteen havaittiin, että masentuneet lapset hyötyivät interventiosta enemmän ja heidän stressioireensa lievittyivät tehokkaammin, vaikka toimimattomat kognitiiviset arviot vähenivät heillä vähemmän. Sukupuolella ei havaittu moderaatiovaikutuksia, mutta tytöillä stressioireet vähenivät sekä interventio- että verrokkiryhmässä vähemmän kuin pojilla.

Tulosten perusteella masentuneetkin lapset voivat hyötyä ryhmämuotoisista TRT:n kaltaisista interventioista, ja voivat jopa muodostaa kohderyhmän, jolle tällaisista interventioista olisi erityisen paljon hyötyä. Näyttää myös siltä, että negatiiviset kognitiiviset arviot eivät ehkä ole niin keskeisiä PTSD:ssä sodan traumatisoimilla lapsilla kuin teorian perusteella on ajateltu, ainakaan sentyyppisissä konteksteissa, jota tässä tutkittiin.

TABLE OF CONTENTS

INTRODUCTION

Children in War and Conflict

It is estimated that over one billion children under the age of 18 live in countries or territories affected by armed conflict (UNICEF, 2009). Millions of children worldwide are subject to or witness grave violations of their most fundamental human rights. Many children show amazing resilience in the face of such terror and do not develop long-lasting emotional disturbances (Feeny, Foa, Treadwell, & March, 2004). However, armed conflict is always a major risk factor for mental health and developmental problems in children (Barenbaum, Ruchkin, & Schwab-Stone, 2004). A major result of exposure to serious traumatic events such as war and armed conflict can be the development of posttraumatic stress symptoms (PTSS). Indeed, a recent extensive review (Attanayakea et al., 2009) found an overall estimate of 47 % incidence of clinical-level PTSS for children (n = 7920) directly exposed to such conflicts, while 43 % suffered from depression and 27 % from anxiety disorders. All these levels are many times higher than those found in general populations.

In Palestine, which is the focus of this thesis, a complex situation with alternating times of open conflict and tense periods of relative peace has existed since the 1948 Arab-Israeli War. Refugeeism, war and violence have had grave effects on Palestinian children, too. In the aftermath of the Second Intifada starting in 2000, and the Israeli military offensives in Spring 2002, over 80 % of children reported having witnessed shootings and over 60 % had seen a family member injured or killed (Qouta & El Sarraj, 2004). Nearly all the children studied (93 %) reported feeling "not safe" and "exposed to attack" (Arafat & Boothby, 2003). These very high numbers of traumatic events help to explain the fact that over 30 % of Gazan children studied at that time showed evidence of severe posttraumatic stress symptoms, while nearly half had moderate levels of PTSS (Qouta & El Sarraj, 2004). More recently, the Gaza War/Massacre of 2008–2009 lead to the deaths of close to a thousand civilians, with 5000 people injured and over 50 000 displaced (PCHR, 2009). Again, children bore much of the brunt of this conflict.

Seeing this massive scale of suffering caused to the most innocent, a number of organizations, scholars and clinicians have in recent years accelerated efforts to create and implement psychological and psychosocial interventions to help alleviate the posttraumatic symptoms of war-affected children. Though many of these interventions do appear to be helpful, the results of studies

on their effectiveness are mixed (IASC, 2007; Jordans, Tol, Komproe, & Joop, 2009; Peltonen & Punamäki, 2010), and it is still to a large extent unclear how and in which conditions such interventions work and which children benefit the most from particular kinds of interventions, treatments and programs. More research is needed into the specific working components of interventions, and the best possible ways of implementing them. By examining the results of a psychosocial intervention carried out among war-affected children in Gaza, Palestine, this thesis aims to contribute to our understanding of the mechanisms of action through which psychosocial interventions can alleviate posttraumatic symptoms and of factors that might affect intervention effectiveness.

Traumatic Events and PTSD

The phenomenon of psychological distress after traumatic events has been discussed for as long as psychology as a science has existed (Freud, 1919; Putnam, 1898). The particular pattern of psychological problems following a traumatic event was eventually defined in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1980) as a psychiatric disorder called Posttraumatic Stress Disorder (PTSD). In its psychiatric formulation, PTSD is characterized by the persistence for over a month of main symptoms divided into three clusters: re-experiencing or intrusion symptoms, avoidance or numbing symptoms and hyperarousal symptoms.

Over the decades, PTSD has been conceptualized and modelled within a variety of traditions and frameworks. From the 1970s onwards, cognitive accounts have gained the most prominence, starting with the seminal work of Horowitz (1986). He presented a social-cognitive view of what he termed stress response syndromes, and in the process offered the first major cognitive model of reactions to trauma. In Horowitz's work, fundamentally rooted in psychodynamic theory (Freud, 1919) but based on schematic representations, he argued that the main driving force for the processing of information related to a traumatic event stems from a completion tendency. Trauma survivors experience an initial failure to complete, as the new upsetting trauma-related thoughts, feelings and memories cannot be organized into current mental structures and schemas of meaning. Defence mechanisms are then activated to protect the overwhelmed mind, and the survivor typically goes through a period of denial and numbing. During this period, information related to the trauma

is maintained in what Horowitz (1986) terms "active memory" and tends to break through involuntarily back into conscious awareness, causing intrusive symptoms and hyperarousal.

Another important early model of PTSD was the fear network account of Foa, Steketee, and Rothbaum (1989). This model was based on the idea of an associative network in long-term memory containing stimulus information about and reactions to feared objects, together with information that links these stimuli and reactions together (Dalgleish, 2004). In anxiety disorders, such a fear network would become pathologically expansive. For example, traumatic events that involve human violence or cruelty would violate previous expectations of a benevolent, safe world, and cause the network to expand to include elements and objects related to the event that were previously seen as safe aspects of one's environment.

These accounts of PTSD share certain core assumptions with several other cognitive theories that came after them. They all see pathological posttraumatic reactions as developing when individuals try to but fail in integrating the new trauma-related information that is incompatible with pre-existing beliefs and schemas (Brewin, Dalgleish & Joseph, 1996).

However, the models discussed above are limited in their capacity to explain the role of pre-trauma risk factors and the ways in which survivors generate and process emotions related to the trauma. This is due to their uni-representational structure (Dalgleish, 2004). In other words, both models suggest that information about the trauma is maintained in a single format of representation, whether it be the active memory of Horowitz (1986) or the fear network of Foa, Steketee, and Rothbaum (1989). To more fully account for the processes of the onset and maintenance of PTSD, a number of models have been developed that are multi-representational in nature, that is, include two or more formats of representations in their explanation of PTSD. Today, the two models that have had the greatest impact on understanding, researching and treating PTSD in adults are the Dual Representation Theory of Brewin, Dalgleish, and Joseph (1996), and the cognitive model of Ehlers and Clark (2000). These modern models of PTSD take into account the great individual differences found in susceptibility to PTSD and especially the roles of cognitive processing at the time of trauma as well as attitudes and appraisals related to the traumatic event.

The Dual Representation Theory account of PTSD provided by Brewin, Dalgleish, and Joseph (1996) proposes two types of representations of traumatic experiences to understand the phenomenology of PTSD. Verbally Accessible Memories (VAM) would be detailed but highly selective autobiographical memories of the event that can be deliberately accessed and progressively edited. Situationally Accessible Memories (SAM) for their part would represent sensory and physiological aspects of the experience (e.g., sights, sounds, smells and bodily sensations) as analogical codes, enabling the experience to be recreated in response to particular

cues. Traumatic events are recorded in both types of memories, and both are capable of biasing other cognitive processes, generally in a trauma-congruent manner. The consciously perceived representations of the events in VAMs may differ widely from the associations and emotional states that mark the SAMs, and the VAMs may contain dissociative gaps.

According to this account, a person exposed to a traumatic event will engage in intense emotional processing of the experience (Brewin et al., 1996). The trauma arouses secondary negative affects, especially guilt, shame and anger, and the survivor then attempts to reduce this arousal by reasserting control, reattributing responsibility and achieving effective integration of the new upsetting information. If she/he succeeds in reducing this arousal, the processing will prevent the continued automatic reactivation of the SAMs about the trauma. This processing should take place in both Verbally and Situationally Accessible Memories, by achieving habituation to the strong emotions and reactions elicited by activation of the SAMs and by consciously working through and integrating the VAMs.

The process can finally end in one of three possible ways: completion/integration, chronic emotional processing or the premature inhibition of processing. Successful completion of emotional processing would mean the integration of the traumatic event into autobiographical memory. In chronic emotional processing, aversive secondary emotions interfere with habituation to trauma-related memories. This chronic processing predicts prolonged and severe posttraumatic stress symptoms. PTSD is thus seen as a particular type of unsuccessful adaptation to trauma where the survivor fails to reduce the intensity of the trauma memories. In the case where emotional processing has stopped prematurely, the traumatic memory will still be loaded with high levels of negative emotion, even if its activation can generally be avoided. This may lead to persistence in biases of attention and perception towards trauma-related information, i.e., the survivor is still overly concerned or even obsessed with the trauma, even if she/he does not suffer from clinical-level PTSD.

The cognitive model of PTSD presented by Ehlers and Clark (2000) is primarily an account for the persistence or chronicity of posttraumatic stress symptoms (PTSS) and takes into consideration the importance of cognitions (e.g., thoughts, attributions, appraisals) in the development and maintenance of PTSD (Dalgleish, 2004). The core insight of the model is that posttraumatic stress reactions become persistent when survivors process the trauma in a way leading to a sense of "serious, current threat". The continued experience of threat is thought to develop due to maladaptive ways of appraising and processing the traumatic event, i.e., excessively negative appraisals of the trauma and its sequelae, on the one hand, and disturbed processing of autobiographical memory, on the other. The disorder is then maintained through problematic,

dysfunctional behavioural and cognitive strategies, such as avoidance and rumination. These strategies, in addition to directly contributing to PTSD symptoms, prevent improvements in overly negative appraisals of the traumatic event and its sequelae and in the features of the trauma memory.

The excessively negative trauma-related cognitive appraisals include dysfunctional interpretations of the world (e.g., “the world is completely unpredictable” or "anything could happen at any moment") and the self (e.g., "everyone can see I'm too weak to cope", "my life is ruined" or “I'm going crazy”) (Meiser-Stedman, 2002). These appraisals maintain a sense of on-going threat and danger, which seems to be critical to prolonged PTSS, as the survivor keeps up an exaggerated perception of the likelihood of future harm (Ehlers & Clark, 2000; Bryant, Salmon, Sinlair, & Davidson, 2007).

The disturbed trauma memories for their part are characterized by poor elaboration and contextualization, strong associative memory and strong perceptual priming. According to Ehlers and Clark (2000), the nature of the traumatic memories will be a function of the way information is processed at the time of the trauma. Analogously to the Verbally and Situationally Accessible Memories of Brewin et al. (1996), they speak of conceptually-driven or data-driven information processing. When the information is processed more conceptually, it will be easier to consciously access and manipulate the resulting memory later. If, however, processing at the time of trauma is overly data-driven, the trauma memory will be relatively difficult to retrieve intentionally, and there will be strong perceptual priming for accompanying stimuli, accounting for re-experiencing symptoms. The resulting memory trace will also be poorly discriminated from other memory traces.

Fundamentally, few crucial differences exist between the Brewin et al. (1996) and Ehlers and Clark (2000) models. Both consider initial intrusive phenomena to be a normal reaction to an extreme unexpected event, and see the maintenance of the intrusive phenomena to be the result of a number of maladaptive responses to the event (Meiser-Stedman, 2002). Further, both models explain the special characteristics of trauma memories by appealing to differences in the process of encoding the event into memory representations. They differ mainly in explaining what keeps the processing of traumatic experiences from being successfully completed, with Brewin et al. (1996) appealing to aversive secondary emotions interfering with the process, and Ehlers and Clark (2000) emphasizing the role of dysfunctional negative appraisals in keeping up a sense of continued threat.

Alternatives to this cognitive view of PTSD have also appeared in recent years. According to the Landmark Model of PTSD by Berntsen, Willert and Rubin (2003), the core problem of PTSD lies in the traumatic event becoming too central to an individual’s life story, so that it becomes a reference point for other events in the person’s life, affecting the way the survivor interprets future events and

ascribes meanings to them. The standard (DSM-IV; American Psychiatric Association, 1994) view of PTSD as an event-based disorder has also been challenged by Rubin, Berntsen and Bohni (2008), who emphasize that all evaluations and descriptions of the event are based in the here and now. Hence, distortions and biases in current memories of the event would be more important for defining and understanding PTSD than the features of the traumatic event or the type of cognitive processing that occurred during it. In this view, any findings regarding the traumatic event and related symptoms relate first and foremost to the current perception of the event, not the event as it happened in the past per se.

In sum, the modern cognitive views of post-traumatic stress disorder conceptualize it as an anxiety disorder that includes non-anxiety symptoms (Zayfert & Becker, 2006), characterized by involuntarily triggered intrusive memories of a traumatic event with concurrent difficulties in intentionally retrieving an accurate, complete memory of the event in detail (Horowitz, 1986; Ehlers & Clark, 2000). Memories of the event will tend to be fragmented and disorderly, and the individual will have difficulties integrating the narrative of the event into his or her own life story in a coherent manner.

PTSD in Children

The models of posttraumatic stress disorder discussed above were developed, in the first place, to account for and explain trauma-related symptoms observed in adults. Indeed, there was relatively little systematic study of posttraumatic symptomatology in children before the 2000s (Salmon & Bryant, 2002). Although it is thought that the likelihood of developing PTSD after a traumatic event is similar in children and adults (Fletcher, 1996), generalizing results based on adults and theories designed to explain adult reactions to children and adolescents is somewhat problematic. We know that the developing brain is particularly sensitive to stressful events, especially when they are unpredictable and uncontrollable (Meiser-Stedman, 2002). Clearly, developmental features affect the way children of different ages understand, appraise and process traumatic events, and taking note of normal developmental processes as well as contextual factors relating to the life of the child and his/her environment is thus crucial for understanding and treating PTSD in children (Salmon & Bryant, 2002).

There is general acceptance that children too re-experience traumatic events, in particular through behavioural re-enactment, and can suffer from intrusive thoughts about such events. In his

review, Meiser-Stedman (2002) argues that evidence also exists for the presence of non-verbal memories of the kind identified by Brewin et al. (1996) as SAMs in children too. Further, it seems even quite young children can have verbal memories including dysfunctional overly negative appraisals and secondary emotions such as guilt and anger, in line with the Brewin et al. (1996) and Ehlers and Clark (2000) models. The role and importance of thought control strategies for children seems more uncertain (Meiser-Stedman, 2002).

Several studies have found empirical evidence for the applicability of cognitive models of PTSD to children. Ehlers, Mayou and Bryant (2003) reported that in children 5–16 years old, dysfunctional negative appraisals of the trauma and its sequelae, perceived alienation from others and anger were significant predictors of PTSD at three and six months post-trauma following a motor traffic accident. Dysfunctional negative appraisals were measured as negative interpretations of intrusive memories (i.e., as evidence of "going crazy").These findings are in line with data on adults and congruent with the predictions of Ehlers and Clark (2000) and Brewin et al. (1996).

Further testing the applicability of the Ehlers and Clark (2000) model to children, McKinnon, Nixon and Brewer (2008) found that perceptions of memory quality mediated the relationship between data-driven processing and intrusive reactions in 7–16-year-old traumatically injured children (n = 75). That is, children who reported confusion, inability to think coherently and piece the event together and being overcome with sensory details at the time of the trauma (thought to indicate data-driven processing) were left with more fragmented and unclear memories of the event, and this in turn was associated with increased intrusion (though not avoidance or arousal) symptoms later on. This finding is also in line with the predictions of Ehlers and Clark (2000).

Meiser-Stedman, Dalgleish, Smith, Yule, & Glucksman (2007) found that among 10–16-year-old survivors (n = 93) of a single traumatic event, more sensory-based memories were associated with acute stress symptoms soon after trauma, consistent with the theoretical expectations of both the Ehlers and Clark (2000) and Brewin et al. (1996) models. Further, indicators of trauma memory quality and cognitive style variables (e.g., rumination tendency and positive endorsement of worry) were found to mediate the relationship between peri-traumatic subjective threat and fear and acute stress symptoms soon after the trauma. According to the authors, this suggests that the way the survivor initially encodes the traumatic event into memory is potentially critical for determining and mediating the onset of posttraumatic stress responses also in younger populations. Further, cognitive factors affecting the encoding of the trauma (rumination tendency, sensitivity to anxiety) may lay the foundation for more chronic dysfunctional negative appraisals about the trauma and one's response to it, leaving the child vulnerable to the development of later PTSD.

A follow-up to the study (Meiser-Stedman, Dalgleish, Glucksman, Yule, & Smith, 2009a) investigated whether dysfunctional trauma-related appraisals at six months post-trauma would be associated with PTSS at this later stage. The dysfunctional appraisals were measured by the Children's Posttraumatic Cognitions Inventory (cPTCI). It was found that excessively negative appraisals about the traumatic event were significantly and independently associated with symptom levels at six months, even after controlling for symptom levels one month post-trauma. Further, cognitive appraisals specifically relating to feelings of permanent and disturbing change mediated the relationship between symptoms at 2-4 weeks and symptoms at 6 months with a large effect size. This suggests that, for children traumatized by a single event, such dysfunctional appraisals are not just correlates of symptoms but are in fact implicated causally in the development and later maintenance of the posttraumatic stress responses.

Bryant et al. (2007) examined the roles of event-related and demographic factors, initial stress reactions and cognitive appraisals in predicting the chronicity of PTSD among 7–13-year-old children (n = 62) following various forms of traumatic injury. In the final model accounting for 33 % of the variance in chronic PTSD, the appraisal of feeling small and feeble in a threatening world (as measured by a cPTCI subscale) was the only factor studied significantly predicting chronic posttraumatic stress severity.

Though both of these two studies found dysfunctional negative appraisals to be linked to PTSS, the Bryant et al. (2007) study reported this link to be significant for different types of appraisals than the Meiser-Stedman et al. (2009a) one. The authors (Bryant et al., 2007) suggest this may be due to the younger age of the children they studied, in that younger children may be more concerned about their imminent vulnerability, whereas older children and adolescents worry about how the trauma has altered their identity.

Put together, the studies described above provide evidence that dysfunctional negative appraisals seem to be implicated in the development and maintenance of chronic posttraumatic stress symptoms in children. There is also some, more limited evidence for the role of secondary emotions in this process.

Treating PTSD

Cognitive-behavioural therapy (CBT) in its many forms can today be considered the standard approach to treating PTSD. According to a systematic review of randomized, controlled studies

(Bisson & Andrews, 2009; n = 33), trauma-focused cognitive-behavioural therapy (TFCBT) is the treatment for which the best evidence exists for effectiveness in reducing PTSD symptoms among adult trauma survivors, as compared to a waitlist condition. However, the review found no significant differences in effectiveness between TFCBT, eye movement desensitization and reprocessing (EMDR) therapy and stress management therapy. This is in accordance with the earlier view that no unequivocal evidence exists that some particular form of CBT would be superior to others (Zayfert & Becker, 2006). In any case, cognitive-behavioural therapy broadly speaking is the primary treatment for PTSD recommended for both adults and children according to national guidelines in several countries (NICE, 2005; Ponteva et al., 2009) and is generally considered the most efficacious treatment by practitioners (Zayfert & Becker, 2006).

Beck, Coffrey, Fory, Keane, and Blanchard (2009) demonstrated that CBT administered in a group setting can also be an effective way of treating PTSD, resulting in significant reductions in symptoms, with attrition rates and patient satisfaction levels similar to individual settings. The authors note, however, that modifications to the CBT framework are necessary to avoid iatrogenic risks, in particular as relates to the use of exposure in groups. Based on one meta-analytic review (Barrera, Mott, Hofstein, & Teng, in press), forms of CBT with and without exposure offer comparable effectiveness, though patients often have strong preferences about the kind of therapy they would like to receive. For children in particular, based on a review of treatment outcome literature, Feeny et al. (2004) argued that good and growing support exists for the usefulness of group-administered CBT in the reduction of PTSD symptoms.

When treating PTSD with CBT methods, the fundamental focus is on changing the dysfunctional behaviours and cognitions that have developed in response to trauma and are presumed to maintain the symptoms (Zayfert & Becker, 2006). Although a wide range of treatment methods exist within CBT (Stallard, 2006), this change is usually achieved through methods of cognitive restructuring and exposure to the trauma in a safe environment. As regards the active components of treatment, that is, the specific changes that are thought to be related to reducing PTSS, theory (Ehlers & Clark, 2000) would suggest these changes to include better integration and processing of trauma memories, as well as reductions in dysfunctional cognitive appraisals related to the trauma.

Indeed, the Ehlers and Clark (2000) model has generated effective treatments for adults (e.g., Ehlers, Clark, Hackmann, McManus, & Fennell, 2005) with evidence of the crucial role of changes in cognitive appraisals in reducing PTSS. The theoretical premise that recovery occurs due to better integration of memories has not been confirmed empirically. Some studies suggest that rather than evincing beneficial treatment effects on memory processes, narrative changes in the direction of

more organized memories may be a more general “side effect” of exposure treatment itself (see, e.g., van Minnen, Wessel, Dijkstra, & Roelofs, 2002).

Among children, evidence for the role of improved memory representations and reduced negative appraisals in mediating treatment outcomes is scarce. However, Smith et al. (2007) found a statistically significant mediating role for improvements in dysfunctional negative appraisals in reducing PTSD symptoms for traumatized children treated with individual CBT. This seems in line with both theory (Ehlers & Clark, 2000) and the studies already mentioned (Ehlers et al., 2003; Bryant et al., 2007; Meiser-Stedman et al., 2009) that link such appraisals to the maintenance and course of PTSD.

Interventions for Children in War and Conflict

Posttraumatic stress disorder in children can be triggered by a number of different types of traumatic events. With the exception of child sexual abuse, which has been widely studied (Stallard, 2006), most effectiveness studies have focused on single-incident trauma, most commonly motor vehicle accidents. Applying these findings to conditions where children experience traumatic events repeatedly may be problematic. In particular, conditions of war and armed conflict are a special kind of environment where personal safety may be continuously compromised and the very idea of "non-traumatic" normal life questionable. It is therefore necessary to look at studies conducted on treatment programs designed for these specific contexts.

Though quite a number of diverse interventions and psychosocial care programs for children affected by armed conflict are being implemented all over the world, there has been relative scarcity of rigorous studies on treatment effectiveness. However, in recent years, the situation has improved to some extent, as a number of randomized controlled trials on the effectiveness of various psychosocial interventions have appeared (e.g., Bolton et al., 2007; Jordans et al, 2010; Layne et al., 2008; Qouta, Palosaari, Diab, & Punamäki, 2012), together with two extensive reviews of such studies (Jordans et al., 2009; Peltonen & Punamäki, 2010).

Put together, the reviews demonstrate that most studies show some positive effect of interventions for healing and alleviating trauma-related symptoms, with most concentrating on PTSD specifically. Yet, researchers agree that methodological weaknesses and problems in study designs undermine such a conclusion to some extent. Further, the effect sizes found have generally been moderate at best. The reviews call for research aimed at identifying specific working

ingredients of treatments in order to create a comprehensive evidence base (Jordans et al., 2009) and for more methodologically rigorous (randomized and controlled) long-term follow-up studies including developmental outcomes (Peltonen & Punamäki, 2010). Such further research is crucial for developing effective, evidence-based preventive interventions and treatments for children traumatized by exposure to war and violence.

Concurrent with increased research, more structured, manual-based interventions for helping children exposed to war and conflict have appeared. One such intervention is the Classroom-Based Intervention (CBI) program. An adaptation of this program called Psychosocial Structured Activities (PSSA) was implemented among conflict-affected children (n = 203) in Northern Uganda (Ager et al., 2011). The program contained typical CBT elements such as reasserting control, building personal narratives and examining thoughts and reactions during the traumatic events, as well as exercises to build up resilience and encourage community and parental involvement. The program was found to have a positive impact on child well-being, as determined by a locally developed indicator based on local understandings of the concept

In another important effectiveness study, Layne et al. (2008) studied the effectiveness of a multi-tiered mental health program for adolescents exposed to severe war-related trauma in Bosnia. They found significant reductions in PTSD and depressive symptoms after both a general psychoeducation and skills intervention and a manual-based trauma and grief component therapy (TGCT) intervention. However, the reductions were significantly greater for the TGCT group and not only statistically but also clinically and practically highly significant, as average symptom scores in this group dropped from the severe range to the mild range. The authors stress the importance of pre-intervention screening surveys and interviews to identify suitable participants who are at risk of prolonged severe distress but also simultaneously not at acute need of individual mental health treatment. Such pre-screening should be conducted to minimize the possible iatrogenic risks of exposure for those needing acute individual help and to maximize the usefulness of the intervention for the participants.

Teaching Recovery Techniques

The intervention under study in the present thesis is Teaching Recovery Techniques (TRT; Smith, Dyregrov & Yule, 2002), developed by the Children and War Foundation. It is an intervention aimed at secondary prevention of persistent problems and speeding up recovery after traumatic

events. TRT is designed to be used in a group setting, most commonly and easily in schools, for children exposed to armed conflict and war, but it has also been successfully employed among children traumatized by natural disasters (e.g., Giannopoulou, Dikaiakou, & Yule, 2006) and sexual abuse (Pekkarinen, Punamäki, & Poijula, 2007). Its main focus is on children's posttraumatic stress reactions, primarily on intrusions, over-arousal and avoidance. The manual-based intervention consists of, at minimum, five sessions: two dealing with intrusive memories, thoughts, and feelings, one with psychological over-arousal and the final two with avoidance and exposure. A variety of techniques are employed during the intervention, including normalization of stress reactions, psychoeducation, symbolic and dream work, relaxation techniques and exposure.

TRT can be run by a wide variety of childcare professionals after some training and does not require a lot of additional materials. It is, therefore, a practical choice for secondary prevention when working in complex and difficult environments, where child mental health care professionals may be in short supply and the need for psychosocial help and support among children is widespread. This thesis reports on an implementation of TRT in Gaza, Palestine. In the specific case of Gaza in 2009, the strict Israeli blockade further restricted the availability of expertise, materials and training personnel. In the context analyzed in this thesis, the TRT intervention was modified to suit local conditions, with more emphasis on symbolic work thought to be culturally relevant, e.g., dream work, and an extended program of sixteen meetings was employed.

TRT has already been used in a number of contexts, and has been found effective in reducing PTSS in children affected by natural disasters (Giannopoulou et al., 2006) and war (Ehntholt, Smith, & Yule, 2005; Qouta et al., 2012). Giannopoulou et al. (2006) reported very good results of TRT's effectiveness in reducing posttraumatic stress and depressive symptoms among children suffering from PTSS due to an earthquake. The beneficial impacts were also maintained at follow-ups up to four years. For refugee children traumatized by war, Ehntholt et al. (2005) found the TRT intervention to reduce the severity of depressive as well as PTSS, particularly intrusion, though the gains were not maintained well at follow-up.

Based on the same data employed in this thesis, Qouta et al. (2012) found that for children exposed to war and conflict, the TRT intervention significantly reduced the proportion of clinical-level PTSD among boys, and both the symptom levels and proportion of clinical PTSD among girls who had low levels of peritraumatic dissociation. Indeed, peritraumatic dissociation is considered a risk factor for PTSD in children (Schafer, Barkmann, Riedesser, & Schulte-Markwort, 2006) that may interfere with therapy outcomes. The study indicates that, at least for girls, high levels of peritraumatic dissociation seemed to hinder the effectiveness of the intervention, and perhaps

further that a general preventive intervention such as TRT may not be very helpful for such children.

Looking at these effectiveness studies, it seems clear that many other factors apart from the intervention itself and its features can affect its effectiveness for particular children. For example, in the study by Ehntholt et al. (2005), gains attained from the intervention were not maintained at follow-up for refugee children, while in the study by Giannopoulou et al. (2006) treatment gains were maintained for up to four years. It may be that TRT-type interventions are more successful for mild to moderate cases of PTSD, as in the Giannopoulou et al. (2006) study, and that results are better maintained in situations where additional social problems and uncertainties do not complicate the situation. Based on the results obtained by Qouta et al. (2012), it also seems that certain features of the traumatic event or the child's reaction to it, such as the peritraumatic levels of dissociation which they specifically studied, may also influence the effectiveness of psychosocial interventions.

Objectives and Hypotheses

As discussed, researchers have emphasized that the further development and improvement of psychosocial treatments would benefit from identifying the underlying mechanisms of action of treatment effects (Jordans et al., 2009). Understanding the processes that account for beneficial change is crucial for optimizing treatment (Kazdin, 2007). Exploring factors that might mediate intervention effects is an important step in developing this understanding.

Expanding research settings to also include moderators, that is, factors that affect intervention outcomes negatively or positively, has also been suggested by several researchers (Tol et al., 2010; Peltonen & Punamäki, 2010). More information on the moderating effects of, e.g., demographic and comorbidity factors would be important for tailoring and customizing interventions better in the future.

Simultaneous depression was suggested as one cause of non-maintenance of gains in PTSD symptom reduction by Ehntholt et al. (2005). Considering the great comorbidity and significant associations between PTSD and depression in general (Berntsen & Rubin, 2007) and for war-affected children in particular (Thabet, Abed, & Vostanis, 2004), the possible effects of simultaneous depression on interventions aimed at reducing PTSS appear an important area of study. Regarding the role of gender differences, some limited evidence exists for both greater vulnerability to trauma and more benefits from interventions for girls (Bolton et al., 2007; Tol et al.,

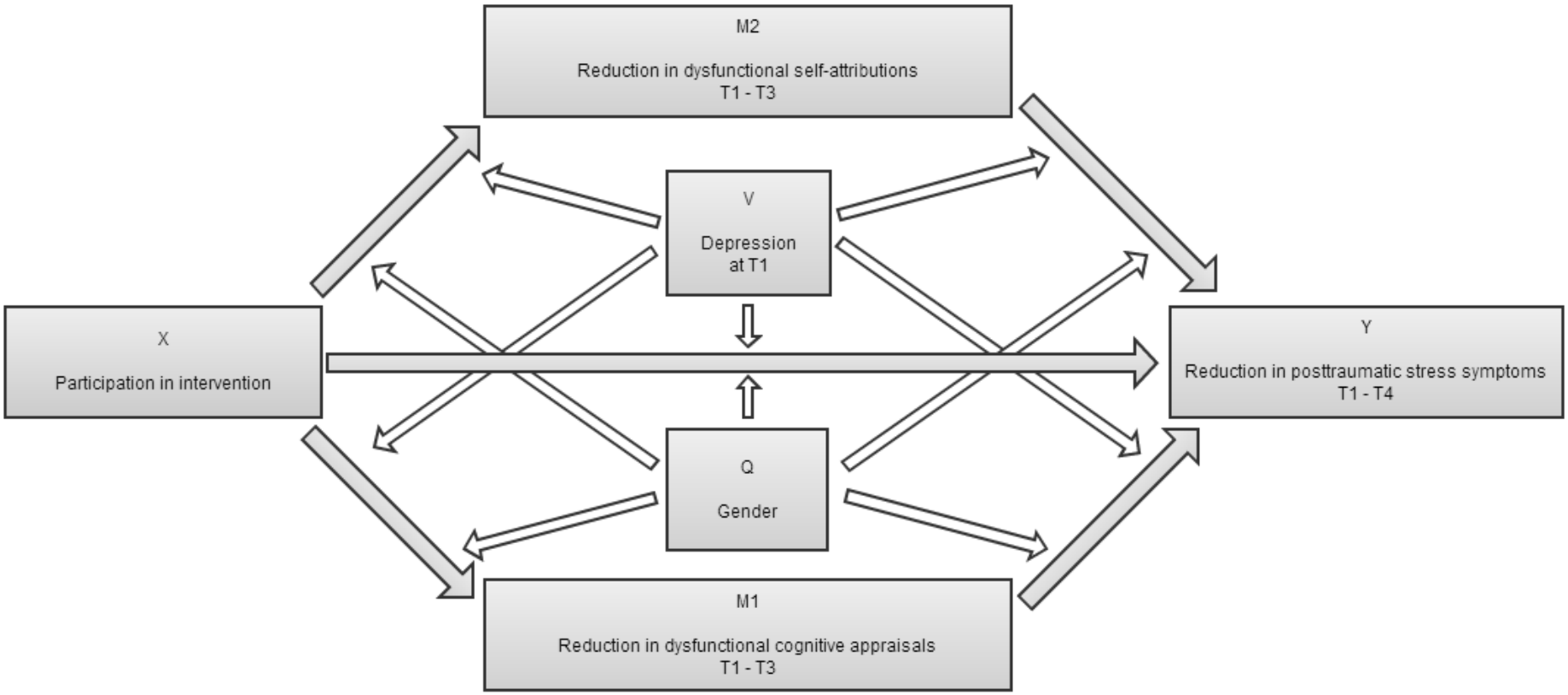
2010). Overall, however, differences between the genders have appeared inconsistent in intervention outcome studies (Jordans et al., 2009; Peltonen & Punamäki, 2010), and more research is called for.

As regards the processes that might mediate the effects of psychosocial interventions in reducing PTSS, the Ehlers and Clark (2000) model of PTSD would suggest reductions in dysfunctional negative cognitive appraisals about the trauma to be crucial. In individual cognitive therapy for PTSD, such reductions have indeed been found to mediate treatment effects for adults (Ehlers et al., 2005) and children (Smith et al., 2007) after single-incident trauma.

This thesis aims to expand on these results by studying the possible mediating role of reductions in dysfunctional negative cognitive appraisals in reducing PTSS in a psychosocial intervention for children exposed to armed conflict. It will also study the possible mediating role of reduced guilt and self-attributions in the treatment effects, as would be suggested by the Brewin et al. (1996) model's emphasis on aversive secondary emotions in the maintenance, and so, perhaps, treatment, of PTSD. This thesis also aims to contribute to the further discovery of factors that may affect intervention outcomes for particular groups of children by focusing on the potential moderating effects of comorbid depression and gender on both the direct and possible mediated effects of the intervention in reducing PTSS.

Accordingly, it is hypothesized that **1)** participation in the psychosocial TRT intervention will lead to greater reductions in dysfunctional negative cognitive appraisals and self-attributions as compared to a control group, and that **2)** the greater reductions in dysfunctional negative cognitive appraisals and self-attributions will have statistically significant mediating roles in reducing posttraumatic stress symptoms. In addition, the thesis will examine the possible moderating effects of depression at the start of the intervention and gender on **a)** the intervention's effects on dysfunctional negative cognitive appraisals and self-attributions, **b)** the intervention's total effects on PTSS reduction and **c)** the intervention's hypothesized mediated and direct effects on PTSS reduction.

Figure 1. Conceptual representation of all hypothesized direct and mediated paths of intervention effects (thick, grey arrows) and potential moderator effects (thin, white arrows).



METHOD

Participants

The participants were 482 Palestinian school children, 240 boys and 242 girls, 10-13 years old (M = 11.29, SD = 0.68) at the time of the study. The sample of the study came from two regions of the Gaza Strip, namely North Gaza and Gaza City. The participating four schools were randomly sampled from a list of government schools provided by the Ministry of Education. From each of these schools, two girls' and two boys' classes were randomly sampled (10-11-year-olds and 12-13 year-olds). Finally, by cast lots, in each school, one girls' class and one boys' class was selected to be included in the intervention group, while the other two classes were assigned to the waiting list group. In the end, the control group (n = 240) consisted of 120 girls and 120 boys, and the intervention group (n = 242) of 120 girls and 122 boys.

Procedure

All participating children took part in a baseline assessment in April 2009, carried out by Dr. Samir Qouta together with six trained research assistants, all graduate students of psychology. Consent for the children's participation was obtained from their parents, and a letter with information about the study was sent to them. Participants, parents, teachers and research assistants were unaware of the intervention status of the children at the baseline.

The Teaching Recovery Techniques (Smith et al., 2002) intervention for children exposed to armed conflict was adapted to suit local conditions of war. An Arabic language version of the manual was used. Starting in May 2009, the intervention was carried out in groups of 15 children each, with two psychologists running each group. The version implemented included eight sessions of two hours each, delivered twice per week, resulting in a four-week program. After the follow-up period of the study, the waiting list group were provided the same intervention the intervention group had received earlier.

A wide-ranging battery of instruments was used to assess the participants before (T1), during (at the mid-point, T2) and after the intervention (T3), and as follow-up six months later (T4). The

assessments consisted of structured child-rated questionnaires. All instruments were used in their Arabic translations.

Instruments

Posttraumatic stress symptoms were measured using the 13-item Children's Revised Impact of Events Scale (CRIES; Smith, Perrin, Dyregrov, & Yule, 2003). This self-report questionnaire includes four items relating to intrusion symptoms, four to avoidance and five to (hyper)arousal symptoms. Children evaluated on a 4-point scale (0 = *not at all*, 1 = *rarely*, 3 = *sometimes*, 5 = *often*) how often they had experienced a particular symptom over the last two weeks. The sum total of the questionnaire has a range of 0–65. Sum variables were constructed for T1 and T4, with Cronbach's $\alpha = 0.64$ at T1 and $\alpha = 0.61$ at T4. A change score variable was then constructed by subtracting the T1 score from the T4 one.

Posttraumatic cognitive appraisals were measured using the 25-item Children's Post Traumatic Cognitions Inventory (cPTCI). The measure was found to be reliable and valid in a large validation study of traumatized and non-traumatized children (Meiser-Stedman et al., 2009b), The inventory consists of 25 statements relating to negative appraisals of the world and the self, with the child using a 4-point scale to indicate their agreement with the statements (1 = *don't agree at all*, 2 = *don't agree a bit*, 3 = *agree a bit*, 4 = *agree a lot*). Scores on the inventory range from 25 to 100. Sum variables were constructed for cPTCI scores at T1 and T3, with $\alpha = 0.85$ at T1 and $\alpha = 0.87$ at T3, and a change score variable was then constructed by subtracting the T1 score from the T3 one.

Trauma-related self-attributions were measured by the four questions constituting the Personal Attributions for Negative Events subscale of the Children's Attributions and Perceptions Scale (CAPS; Mannarino, Cohen, & Berman, 1994). Children evaluated four statements about blaming themselves for what happened on a 5-point scale (from 1 = *never* to 5 = *always*). The sum total of the questionnaire has a range of 4-20. A sum variable constructed for the score at T1 had $\alpha = 0.24$. Due to this very low α value at T1, the last question of the subscale ("Do you feel that you do things that cause problems for you with others?"), which did not correlate significantly with the other items (item-total correlation -0.02 at T1), was excluded. A sum variable (dubbed CAPS-PANE) was then constructed from the first three items of the subscale. This sum variable has a range of 3-15,

and had somewhat improved alpha values of α = 0.39 at T1 and α = 0.45 at T3. A change score variable was again constructed by subtracting the T1 score from the T3 one.

Depression was measured using the Depression Self-Rating Scale for Children (DSRS; Birleson, 1981). The self-report scale consists of 18 statements that the child evaluated on a 3-point scale (0 = *mostly*, 1 = *sometimes*, 2 = *never*), with ten items reversed for scoring. The scale has a range of 0-36. The DSRS has been found to have satisfactory test-rest reliability, good internal consistency and adequate face and factorial validity. A cut-off score of 15 has been established to significantly predict a depressive diagnosis (Birleson, 1981). A sum variable was constructed for DSRS score at T1, with α = 0.66. Based on the cut-off score of 15, a dummy variable was constructed for the likely existence of clinical-level depressive symptoms at T1.

Data Analysis

All statistical analyses were carried out using IBM SPSS Statistics 19 (SPSS 19.0.0). For the mediation analysis, the PROCESS Computational Tool for Observed Variable Mediation, Moderation and Conditional Process Modeling (Hayes, 2012) was employed, providing macros and a dialog extension for SPSS 19.

Due to the cluster sampling procedure, the possible interdependency of the data had to be taken into account. Therefore, the analyses of covariance and mediation analysis were run with school class membership as covariate to account for possible group-dependency.

Testing the first hypothesis that participation in the intervention lead to greater reductions in dysfunctional cognitive appraisals and self-attributions as compared to the control group and the possible moderating effects of depression and gender in these effects was carried out in two parts. First, to examine whether significant changes had occurred during the intervention in these factors (cPTCI, CAPS-PANE), Wilcoxon Signed-Rank Tests were carried out for the intervention and control groups in aggregate, as well as separated between a) the genders and b) depressed and non-depressed children. Then, 2 (intervention group) x 2 (gender) x 2 (clinical depression status at T1) repeated-measures Analyses of Covariance were carried out with cPTCI and CAPS-PANE scores as the dependent variables to determine the effects of each element on these variables.

To study the possible moderating roles of initial depression and gender on the intervention's effects on PTSS, Wilcoxon Signed-Rank Tests for changes in CRIES scores were again first carried

out for the intervention and control groups in aggregate, as well as separated between a) the genders and b) depressed and non-depressed children. Then, the same 2x2x2 ANCOVA was applied to the dependent variable of CRIES in order to determine the effects of each element on PTSS reduction.

To test the second hypothesis that greater reductions in dysfunctional negative appraisals and self-attributions would have mediating roles in reducing PTSS, as well to examine the possible moderating effects of depression and gender on the partial mediated and direct effects, a hypothetical model of moderated mediation, which Hayes and Preacher (in press) call a "conditional process model" was constructed. The model includes the hypothesized mediating factors on the intervention's effects on PTSS, as well as the factors possibly moderating this mediation. This model was evaluated using the PROCESS tool to provide estimates for path analysis parameters employing linear regression. For conditional indirect (moderated mediation) effects, the bootstrapping method for creating bias corrected confidence intervals was employed, with 20 000 bootstrapping samples.

RESULTS

Descriptive Statistics

The average size of the children's families was 6.24 people. On average, the children's fathers were 42.2 years old and mothers 37.5 years old. Regarding the parents' education and employment, 24.4 % of the fathers and 8.0 % of the mothers had university-level education, yet 48.3 % of the fathers and 93.2 % of the mothers were without formal employment.

There were no dropouts from T1 to T3, i.e., during the intervention. From T3 to T4, the end of the intervention to the six-month follow-up, there were 78 (16.2 %) dropouts, most commonly due to changing schools. The children for whom follow-up measurements were not available were not included in the analyses. There were no significant differences between the children who had dropped out and those who remained in terms of intervention group status, age, or other autobiographical measures (parents' age, education and work, family size, home ownership, citizen status, school region). However, significantly more boys (22.5 % of total sample) than girls (9.2 %) dropped out. There were no significant differences between dropouts and the rest in terms of initial (T1) levels of PTSD or depressive symptoms nor in the number of clinical-level cases of depression. There were also no significant differences in initial cPTCI and CAPS-PANE scores. For the remaining sample (n = 404), individual missing data points (n = 1) were replaced through imputation using the mean of nearby points.

Comparing and contrasting the final control and intervention groups, no significant differences existed between the groups in terms of family size, family income and home ownership, nor in the ages and levels of education of the children's parents. There were also no significant differences in initial (T1) levels of dysfunctional cognitive appraisals or in depressive symptoms. However, despite randomization, the children in the control group had significantly less PTSS (CRIES score M = 27.3, SD = 10.8) than those in the intervention group (M = 31.7, SD = *9.58*) and less dysfunctional self-attributions (CAPS-PANE scores M = 8.38, SD = 3.06 vs. M = 9.43, SD = 2.70). The children in the control group were also slightly older (M = 11.35, SD = 0.57 vs. M = 11.18, SD = 0.77).

Table 1. Significance of pre-treatment (T1) to post-treatment (T3) changes in dysfunctional cognitive appraisals (cPTCI) and self-attributions (CAPS-PANE), and pre-treatment (T1) to follow-up (T4) changes in PTSS (CRIES). Results of Wilcoxon Signed-Rank Tests.

		CPTCI				CAPS-PANE				CRIES			
		T1	T3			T1	T3			T1	T4		
Group	n	*Mean (SD)*	*Mean (SD)*	Change	Z	*Mean (SD)*	*Mean (SD)*	Change	Z	*Mean (SD)*	*Mean (SD)*	Change	Z
Control	207	54.82 (11.70)	50.95 (11.64)	-3.87	-4.30***	8.38 (3.06)	9.24 (2.90)	+0.86	-2.75**	27.30 (10.79)	25.83 (9.24)	-1.47	-1.49
female	107	54.54 (11.15)	50.88 (10.83)	-4.66	-3.44**	7.74 (2.81)	8.98 (2.93)	+1.24	-2.84**	26.90 (10.49)	26.92 (9.54)	+0.02	-0.19
male	90	55.14 (12.37)	51.04 (12.96)	-4.10	-2.64**	9.12 (3.18)	9.54 (2.86)	+0.42	-1.02	27.78 (11.17)	24.54 (8.75)	-3.24	-2.25*
no depression at T1	139	53.37 (11.96)	49.02 (12.10)	-4.35	-3.91***	8.22 (2.94)	9.35 (2.88)	+1.13	-3.25**	27.43 (11.75)	24.87 (9.10)	-2.56	-2.24*
depression at T1	58	58.28 (10.32)	55.59 (8.97)	-2.69	-1.85	8.76 (3.31)	8.98 (2.97)	+0.22	-0.23	26.98 (8.10)	28.14 (9.25)	+1.16	-0.85
Intervention	207	54.87 (12.30)	52.48 (11.68)	-2.39	-2.77**	9.43 (2.70)	8.22 (2.84)	-1.21	-4.32***	32.67 (9.58)	24.28 (9.82)	-8.39	-7.96***
female	111	56.05 (11.71)	53.57 (11.27)	-2.48	-2.05*	9.16 (2.75)	8.17 (3.02)	-0.99	-2.43*	33.41 (8.42)	27.01 (10.35)	-6.40	-4.66***
male	96	53.51 (12.87)	51.22 (12.04)	-2.29	-1.80	9.73 (2.64)	8.27 (2.62)	-1.46	-3.88***	31.82 (10.76)	21.13 (8.15)	-10.69	-6.47***
no depression at T1	132	53.01 (12.80)	49.30 (10.71)	-3.71	-3.40**	9.31 (2.91)	8.12 (2.84)	-1.19	-3.42**	31.36 (10.14)	23.32 (9.54)	-8.02	-6.23***
depression at T1	75	58.15 (10.66)	58.08 (11.26)	-0.07	-0.06	9.63 (2.29)	8.39 (2.84)	-1.24	-2.60**	34.97 (8.09)	25.97 (10.15)	-9.00	-4.96***

Note: *** p < .001; ** p < .01; * p < .05.

Table 2. Effects of intervention, gender and initial depression on outcome and hypothesized mediating factors. Results of repeated-measures ANCOVA.

	CPTCI T1 to T3		CAPS-PANE T1 to T3		CRIES T1 to T4	
Source	Mean square	F	Mean square	F	Mean square	F
Time	859.52	10.65**	8.87	0.75	86.21	1.08
Time x Group	360.80	4.47*	84.89	7.15**	1200.41	15.02***
Time x Gender	13.30	0.16	15.53	1.31	656.73	8.22**
Time x Dep	299.89	3.71+	6.55	0.55	52.63	0.66
Time x Group x Gender	3.92	0.05	6.45	0.54	53.94	0.67
Time x Group x Dep	48.30	0.60	1.24	0.10	325.60	4.07*
Time x Gender x Dep	1.36	0.02	3.56	0.30	21.42	0.27
Time x Group x Gender x Dep	3.92	0.05	7.88	0.66	66.70	0.83

Note: *** p < .001; ** p < .01; * p < .05; + p < .10.

Effects on Dysfunctional Cognitive Appraisals and Self-Attributions

Table 1 presents the values of the cPTCI and CAPS-PANE scores at baseline (T1) and after the intervention (T3), together with the significance (according to the Wilcoxon Signed-Rank Test) of the difference in means. The data is presented for the control and experimental groups in aggregate, as well as separated between the genders and between those with clinical depression at T1 and those without. Table 2 presents the results of the repeated-measures analyses of covariance on the effects of intervention group status, gender and initial depression status on changes in cPTCI and CAPS-PANE scores.

The results indicate statistically significant reductions from T1 to T3 in cPTCI scores for both genders in the control group and for girls only in the intervention group. As regards CAPS-PANE scores, significant reductions from T1 to T3 were found for both genders in the intervention group, while in the control group, scores actually increased to a significant degree among girls. Examining differences between children who were depressed at T1 and non-depressed children, significant reductions in cPTCI scores were found in both the control and intervention groups for non-depressed children only. For CAPS-PANE scores, the increases in scores seen in the control group were significant for the non-depressed only, while in the intervention group scores decreased regardless of depression status.

For changes in dysfunctional cognitive appraisals (cPTCI scores), the ANCOVA revealed a significant main effect of time ($F(1, 395) = 4.14$, $p < 0.05$), as well as a significant interaction effect for time x intervention group membership ($F(1, 395) = 4.47$, $p < 0.05$). There was also a marginally significant interaction effect for time x depression status at T1 ($F(1, 395) = 3.72$, $p = 0.055$). The partial η^2 scores for these interaction effects were 0.011 and 0.009, respectively. Contrary to expectations, as can be seen from Table 1, the significant interaction effect for group membership means that while cPTCI scores decreased in both groups, the reduction was smaller overall in the intervention group. The marginally significant interaction effect for depression status suggests that children without depression saw larger reductions in cPTCI scores in both groups.

For changes in self-attributions (CAPS-PANE scores), the ANCOVA revealed no main effect of time, but did show a very significant time x treatment group interaction ($F(1,395) = 14.84$, $p < 0.001$), with a partial η^2 value of 0.04. As can be seen from Table 1, this means that the CAPS-PANE scores for children in the intervention group decreased from T1 to T3, while scores for the control group increased from T1 to T3.

Moderating Effects of Gender and Depression on PTSS Reduction

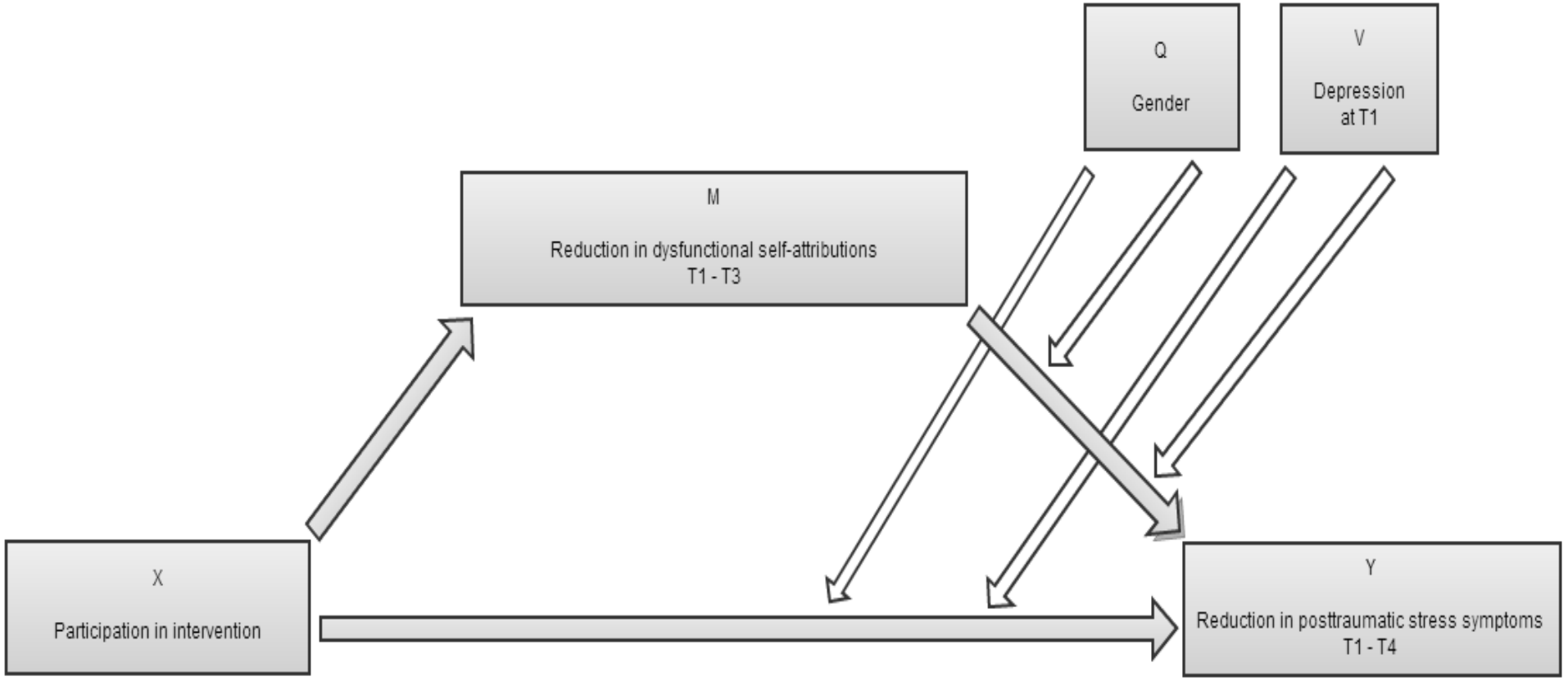
Table 1 presents the values of the CRIES scores at baseline (T1) and follow-up (T4), together with the significance (according to the Wilcoxon Signed-Rank Test) of the difference in means. The data is presented for the control and experimental groups in aggregate, as well as separated between the genders and between those with clinical depression at T1 and those without. Table 2 presents the results of the repeated-measures analysis of covariance on the effects of intervention group status, gender and initial depression status on CRIES scores.

There were significant reductions from T1 to T4 in CRIES scores for both genders in the intervention group and for boys only in the control group. As regards depression status, there were significant reductions in scores in the control group for the non-depressed only, while in the intervention groups scores decreased regardless of depression status.

The ANCOVA revealed no main effect of time but very significant time x treatment group ($F(1, 395) = 15.02$, $p < 0.001$) and time x gender ($F(1, 395) = 8.22$, $p < 0.01$) interaction effects, as well as a significant three-way time x group x depression status interaction effect ($F(1, 395) = 4.07$, $p < 0.05$). Partial η^2 values were 0.04 and 0.02 and 0.01, respectively. As Table 1 shows,

this translates to significantly greater reductions in PTSD symptom scores in the intervention group overall, and to greater reductions in both groups for boys compared to girls. Further, as regards the interaction between intervention group membership and depression at T1, it can be seen that children with initial clinical depression in the control group saw no significant change in their CRIES scores from T1 to T4, while those without depression showed some improvement. At the same time, the CRIES scores in the intervention group decreased regardless of the child's initial depression status. In other words, depressed children benefitted more from the intervention in terms of PTSD symptom reduction.

Figure 2. Conceptual presentation of final moderated mediation model employed in mediation analysis.



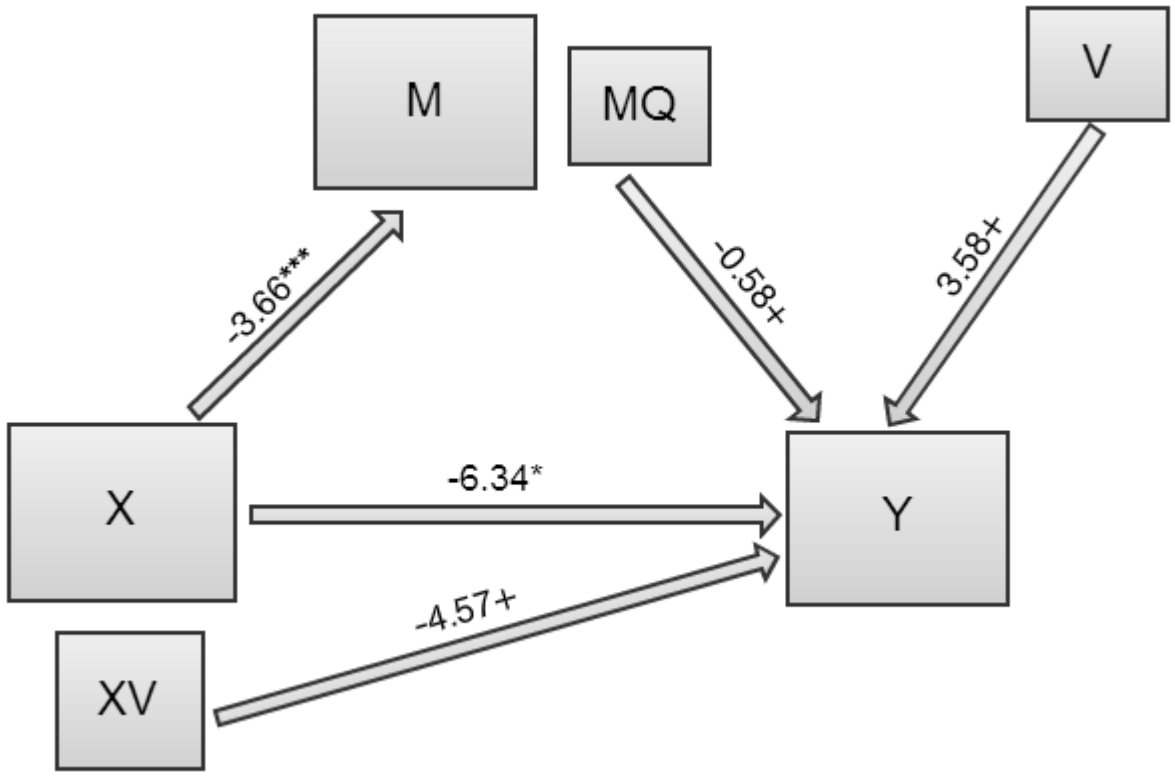
Mediation Analysis

The ANCOVA showed the effects of the intervention on dysfunctional cognitive appraisals to be, contrary to expectations, negative; that is, scores on the cPTCI decreased less for the intervention group as compared to the control group. This meant that the change in cognitive appraisals could not be treated as a mediating factor for the effect of the intervention in reducing PTSS. Therefore, only reduced trauma-related self-attributions (CAPS-PANE scores) remained as a possible mediating factor. As both gender and clinical-level depression at T1 were found to have some associations with reductions in PTSS, they were both included as potential moderators, resulting in the final moderated mediation model presented conceptually in Figure 2. Based on the ANCOVA results, gender and depression at T1 did not appear to contribute to the intervention's effects on CAPS-PANE scores, so their potential moderating effects were modelled to potentially affect the X→Y (intervention to PTSS reduction) and M→Y (change in self-attributions to symptom reduction) paths, but not X→M (intervention to change in self-attributions).

The moderated mediation model is illustrated in Figure 3 with the estimated path coefficients. Errors in estimation and the school class covariate, as well as non-significant path coefficients are excluded from the figure for the sake of clarity. The resulting model was statistically significant ($F(9, 394) = 5.42$, $p < 0.001$), with $R^2 = 0.11$. As can be seen from Figure 3 and Table 3, the path coefficients from intervention group membership (X) to PTSS reduction (Y) (path coefficient -6.34, $p < 0.05$) and to reduction in trauma-related self-attributions (M) (coefficient -3.66, $p < 0.001$) are statistically significant, as required for a partial mediating effect for M. In other words, the model confirms the effects of the intervention in reducing both CAPS-PANE and CRIES scores. However, the path coefficient from change in self-attributions to reduction in PTSS is not significant, indicating no direct (non-moderated) mediation.

As regards the possibility of moderated mediation, as Table 4 shows, the bootstrapped confidence intervals of all conditional indirect effects include zero. There was therefore no clear evidence of mediation through M at any values of the moderators. The effect of the change in CAPS-PANE scores on PTSS as moderated by gender (MQ) was found to be marginally significant (coefficient -0.58, $p = 0.06$), however, suggesting that there was somewhat more of an association between reductions in CAPS-PANE scores and reductions in PTSS among boys, as Table 4 also shows.

Figure 3. A statistical presentation of the final moderated mediation model with estimated path coefficients. Only significant and marginally significant paths are illustrated.



Note: *** p < .001; * p < .05; + p < .10.

X = intervention group membership

M = reduction in trauma-related self-attributions

Y = reduction in PTSD symptoms

V = depression at T1

Q = gender

Table 3. Properties of moderated mediation model for changes in PTSD symptoms.

Outcome: Changes in CRIES scores T1 to T4

Model Summary

R	R^2	df1	df2	F
0.33	0.11	9	394	5.41***

Model

	coefficient	SE	t
Constant	1.75	3.64	0.48
CAPS-PANE T1 to T3	0.13	0.23	0.56
Intervention group	-6.34	2.88	-2.20*
Depression T1	3.58	1.99	1.80+
Gender	-2.61	1.87	-1.40
CAPS-PANE x Gender	-0.58	0.31	-1.88+
CAPS-PANE x Dep	0.19	0.32	0.58
Group x Gender	-2.65	2.64	-1.00
Group x Dep	-4.57	2.76	-1.66+

Outcome: Changes in CAPS-PANE scores T1 to T3

Model Summary

R	R^2	df1	df2	F
0.27	0.07	2	401	15.14***

Model

	coefficient	SE	t
Constant	3.40	1.16	2.93**
Intervention group	-3.66	0.82	-4.49***

Note: *** p < .001; ** p < .01; * p < .05; + p < .10.

Table 4. Conditional direct and indirect effects of the intervention on PTSD symptoms at different values of the potential moderators.

Conditional direct effects

Depression	Gender	Effect	SE	t
No	Female	-6.34	2.88	-2.20*
No	Male	-8.99	3.27	-2.75**
Yes	Female	-10.91	3.23	-3.38***
Yes	Male	13.57	3.59	-3.78***

Conditional indirect effects

Depression	Gender	Effect	Boot SE	Boot LLCI	Boot ULCI
No	Female	-0.47	0.77	-2.10	1.01
No	Male	1.65	1.11	-0.23	4.17
Yes	Female	-1.15	1.06	-3.62	0.67
Yes	Male	0.97	1.28	-1.49	3.60

Note: Number of bootstrap samples used for bias corrected bootstrap confidence intervals: 20 000. Level of confidence for confidence intervals: 95 %
*** p < .001; ** p < .01; * p < .05.

DISCUSSION

Major Findings

The aim of this thesis was to study the effects of a psychosocial intervention on dysfunctional cognitive processing of trauma among children exposed to armed conflict. Such dysfunctional cognitive processing was here operationalized as dysfunctional cognitive negative appraisals and self-attributions. The possible mediating roles of reductions in these dysfunctional appraisals and attributions in reductions in posttraumatic stress symptoms (PTSS) was analysed. The study further aimed to study the possible moderating effects of gender and comorbid depression on the intervention's effects on dysfunctional cognitive processing and PTSS.

The initial hypotheses were partly confirmed, as children in the TRT intervention group showed less dysfunctional self-attributions after the intervention, while for those children in the control group, such attributions increased. However, this was not the case for dysfunctional cognitive appraisals, where, contrary to expectations, taking part in the intervention actually resulted in smaller reductions in such appraisals. Further, no statistically significant moderating effects of depression status or gender were observed for the intervention’s effects on either dysfunctional cognitive appraisals or self-attributions.

The fact that dysfunctional negative appraisals of the traumatic event and its sequelae actually decreased less in those taking part in the intervention was a surprising finding requiring an explanation. Part of the findings could possibly be explained by the fact that for depressed children, taking part in the intervention seems to have prevented spontaneous improvement in negative appraisals, with depressed children in the intervention group seeing no change in such appraisals. However, there was no statistically significant moderating effect in this respect. As such, the results differ from those of Smith et al. (2007) who found identifying and modifying negative appraisals to be an active component of therapy for individual trauma-focused CBT for children. What might further explain this contrary finding?

First, the children in the Smith et al. (2007) study had experienced single-incident trauma, unlike the multiply and continually traumatized children studied here. It may be that dysfunctional negative appraisals are less relevant to the maintenance of PTSD, and hence to treating it, for children exposed to multiple incidents and indeed still living in an area of conflict, as compared to those whose single traumatic event is well in the past. Indeed, in the Smith et al. (2007) study, on-

going trauma-related threat was considered a criterion for exclusion. Second, the treatment in the study by Smith et al. (2007) was individual, whereas the intervention studied here employs group-based methods. It is conceivable that the group environment is not as conducive to changing dysfunctional negative appraisals (that may be shared by the whole group) as a more individual setting.

Further, it could be argued that for the children of Gaza, some of the appraisals studied here, such as "the world is unpredictable and dangerous" are in fact quite realistic, rather than excessively negative or distorted. This is in contrast to the dysfunctional self-attributions, which, even for the conditions of Gaza, are clearly unrealistic (i.e., the children could not have been responsible for the traumatic events of war). With this in mind, it is interesting to consider Dagleish's (2004) suggestion that for individuals whose ideas of the world pre-trauma were already quite negative, some posttraumatic “negative appraisals” may rather be functions of pre-trauma *functional* schematic representations, and so in fact cognitively functional rather than dysfunctional. It is thinkable that this could be the case for many children growing up in the uncertain circumstances of Gaza, especially those who were identified as depressed in this study. For such individuals, Dagleish (2004) suggests a therapeutic environment insistent on changing negative appraisals may be a mismatch. This could help explain why improvement in PTSS and reductions in negative appraisals did not go hand in hand for the children of Gaza studied here.

As already reported by Qouta et al. (2012), the intervention was overall effective in reducing PTSS. In this thesis, it was examined whether this effectiveness would be moderated by depression status and/or gender. No evidence was found for greater effectiveness of the intervention for reducing girls' symptoms, contrary to what Tol et al. (2010) found for Indonesian children affected by political violence. Overall, there was no evidence for a moderating role for gender. As regards the effects of depression, depressed children saw greater reductions in PTSS during the intervention than the non-depressed and benefitted more from taking part in it, providing evidence for a moderating effect of initial depression in the effectiveness of the intervention in reducing PTSS. This is an important finding, which demonstrates that depressed children, too, benefit from group interventions such as TRT, and may even form a target group for whom such interventions would be particularly effective and useful.

Posttraumatic stress symptoms decreased over time in the control group as well. Exploring the effects of gender and depression status in this regard, it was found that the symptom decrease in the control group occurred only for boys and for children without depression, while levels for girls and those with depression stagnated. This secondary finding suggests less spontaneous recovery from PTSS due to exposure to armed conflict over time for girls and for those children with depression.

The gender-related finding is in line with the idea that girls may be more susceptible to trauma and have a more difficult time recovering from it (Bolton, 2007).

As regards the second hypothesis that the effectiveness of the intervention in reducing PTSS would be mediated by positive changes in trauma-related dysfunctional cognitions (appraisals and self-attributions), no clear evidence was found for such mediation effects. For the part of negative appraisals, the fact that children who took part in the intervention showed less reductions in such appraisals meant that changes in these appraisals could not be considered an active element of treatment, i.e., a mediating factor of the intervention's effects on PTSS. While children who took part in the intervention did see greater reductions in dysfunctional self-attributions, these reductions were overall not associated with reduced PTSS, precluding any overall mediating role for self-attributions in the intervention's effects on PTSS. Regarding the suggestion that the mediated effects might be moderated by gender or depression, only for the case of mediation moderated by gender was a weak connection suggestive of association found between reductions in self-attributions and improvement in PTSS for boys. This connection was not statistically strong enough to truly argue for moderated mediation.

The failure to show mediation effects suggests that changes in dysfunctional negative cognitive appraisals or self-attributions were not active components of treatment in this intervention's effectiveness in reducing PTSS. This is in contrast to what might have been expected based on Ehlers and Clark's (2000) idea that overly negative appraisals of the trauma and its sequelae keep up PTSS and the Brewin et al. (1996) model's emphasis on secondary emotions such as guilt in the maintenance of PTSD. The findings suggest that the importance of such dysfunctional cognitions in PTSD may not be universal and applicable to all contexts, such as trauma resulting from a major war studied here. It appears that other factors were more important to maintaining the symptoms and thus alleviating them for this population of severely war-affected children in Gaza.

Limitations of the Study

In interpreting and assessing the results of this research, a number of limitations in the sample and sampling procedure, the methods and instruments used as well as relating to the operating environment under study must be pointed out.

Certain limitations apply to the selection of participants and the sampling procedure employed in this study. Despite the random sampling procedure, some differences existed between the control

group and the intervention group prior to the intervention, in that the control group showed less PTSS and less self-attributions for traumatic events. Further, due to practical reasons, school classes were selected as part of the control or intervention group in their entireties, instead of assigning individual students from each class to both groups, which resulted in cluster sampling. An attempt was made to counter this effect by covariating the school class in the analysis, but this approach to dealing with the effects of cluster sampling may be criticized. It is therefore possible that the sampling procedure still had effects on the results, for example due to the group dynamics of different school classes. Another possible source of error in terms of statistical analysis might be regression to the mean, the phenomenon where a variable that when first measured showed an extreme value will tend to be closer to the average when measured again.

Several limitations and open questions relating to the measures and instruments used in the study should also be discussed. The measure used for assessing trauma-related self-attributions, the Personal Attributions of Negative Events subscale of the Children's Attributions and Perceptions Scale (Mannarino, Cohen, & Berman, 1994) was found to have very low internal reliability in this sample. For this reason, one of the questions of the subscale, which was found not to correlate with the others, was excluded from the analysis. Even so, with the remaining three items, the internal reliability of the measure appeared quite low, which may indicate that the three questions failed to capture the essence of trauma-related self-attributions in the best possible way.

Reasons for the low apparent reliability in this sample may include the fact that the CAPS was originally designed for use with sexually abused children, and children affected by war and armed conflict may experience guilt and self-attributions differently. It should also be pointed out that no validity study of the Arabic translation of the scale has been carried out. Therefore, even with careful translation and piloting, cultural issues might have existed in how the questions on personal responsibility and attributions were understood.

For the part of dysfunctional negative cognitive appraisals, the measure used here, the Children's Posttraumatic Cognitions Inventory has been found to be valid and reliable in a large study (Meiser-Stedman et al., 2009b), but that study involved children with single-incident trauma only. Thus, it may again be questioned how validly this instrument can be applied to studying children with trauma stemming from repeated exposure to traumatic events related to war and armed conflict.

Finally, the measure used in this study to arrive at levels of PTSD symptoms, the CRIES, though widely used and accepted, is not without limitations. Smith et al. (2003) have pointed out in their analysis that while the intrusion and avoidance symptom subscales of the CRIES seem to be robust and well-functioning, the symptoms relating to hypervigilance and arousal seem more likely to change meaning in unsafe circumstances of on-going threat.

Further, the type of symptomatology CRIES aims to measure is based quite exclusively upon European and American theory about reactions to trauma and current clinical thinking about the nature of PTSD. It is still largely unclear whether these conceptualizations are truly culture-independent. Some authors, including Ager at al. (2011), would prefer developing local and culture-specific measures to study the effectiveness of interventions. On one hand, the use of such locally defined, culturally sensitive measures might be preferable when the aim is to determine the actual real-life benefits felt by those the intervention is targeting. On the other, as Ager et al. (2011) too admit, there are several challenges in developing new measures based on local understanding. Such measures cannot easily be compared to other dissimilar indicators when trying to assess the relative effectiveness of different interventions in different locations, and may have little to no rigorous data on validity and reliability.

More widely, the decision to assess the effectiveness of the intervention in terms of PTSD symptom reduction exclusively, as this thesis did, could be criticized. Although Attanayakea et al. (2009) in their review reported PTSD to be the most common serious outcome for children exposed to war, such exposure can cause many other psychological problems too, and comorbidity is very common. Amongst others, Jordans et al. (2009) have brought attention to the tendency to focus, perhaps excessively, on the issue of PTSD in complex emergencies.

In this thesis, the focus was on PTSD exclusively, with depression considered as a possible separate moderating factor. However, researchers (Thabet et al., 2004) studying Palestinian children during conflict earlier have found much overlap between symptoms of PTSD as it is currently defined and depression, with depressive symptoms more directly linked to the number of traumatic events than PTSD as such. They have even suggested that the core PTSD symptoms should perhaps be narrower, as the current conceptualization of PTSD may partly consist of elements of depression. In any case, some research (Smith, 2007) has shown significant improvement in depression too, even if just PTSD is targeted. This suggests depression might often be secondary to PTSD in trauma-exposed children, justifying the practice of treating PTSD first.

The highly challenging operating environment of the Gaza Strip in 2009 also placed its own limitations on the implementation of the intervention in question. First, access to UNRWA-run schools, which make up close to one third of the schools in Gaza, was limited at the time of study, so all the children studied came from schools run by the Education Ministry. This may affect the generalizability of the results even to just all Gazan school-children. Second, both of the areas (North Gaza and Gaza City) the children in the study came from were extensively shelled and damaged during the Gaza War/Massacre, which had ended just two months before the start of the intervention. Thus, the children continued to experience significant social and material hardship at

the time of the study. Such on-going concerns for the future must be taken into account in interpreting the results, and may have had an effect on the maintenance of gains attained during the intervention, as seemed to be the case in the study by Ehntholt et al. (2005) for refugees.

Conclusions

In this thesis, evidence was found that psychosocial interventions such as TRT can reduce trauma-related self-attributions in children exposed to war or armed conflict. For dysfunctional negative cognitive appraisals, such effects were not observed. Overall, the intervention appeared successful in reducing PTSS, particularly for depressed children.

Especially the fact that depressed children benefited significantly more from the intervention in terms of reductions in PTSS, but simultaneously saw a larger hampering effect to reductions in negative appraisals casts serious doubt on the idea that alleviating PTSS could have taken place, at least for these depressed children, through decreased negative cognitive appraisals. This is in contrast to the ideas of the Ehlers and Clark (2000) model of PTSD, and suggests that the role of negative appraisals in maintaining PTSD, at least in war-affected children, may differ from the ideas of their model.

Solid evidence was not found for the role of negative self-attributions in reducing PTSS, either. It is worth noting, however, that reduced self-attributions may well have beneficial impacts on factors other than PTSS. For instance, as guilt and negative self-image are closely connected to depression, it would be interesting to study whether these changes might be associated with or mediate reductions in depressive symptoms or improvements in overall psychosocial functioning. In any case, in light of these findings, explanations other than reduced dysfunctional cognitive appraisals or self-attributions must be sought after for how interventions such as TRT alleviate PTSS, particularly for those children with concurrent depression.

Qouta et al. (2012) in their paper on the effectiveness of the intervention in question point to the importance of screening and tailoring psychosocial interventions to fit the needs of vulnerable groups. In their study, they identified girls with high levels of peritraumatic dissociation as a group who did not seem to benefit from the intervention as regards PTSD symptom levels and proportions. However, based on the results of this thesis, in contrast to those with high levels of dissociation, it appears children with clinical-level depression did benefit from this intervention,

indeed more-so than those without depression. Put together, these results illustrate the complexities involved in determining what exactly works for whom in psychosocial interventions for PTSD.

The authors of the Teaching Recovery Techniques intervention used here are of the opinion that some more severely affected children will continue to need other forms of help after the intervention (Smith et al., 2002). As such, this intervention is not designed to treat complex pathological cases. Similarly, in some interventions (e.g., Layne et al., 2008; Giannopoulou et al., 2006) pre-screening has been used to detect children with co-morbid pathology and exclude them from group interventions. However, excluding more serious and difficult cases has been criticized by others (Stallard, 2006) as unnecessarily limiting the chances of all those who could benefit from interventions from taking part in them. In light of the results obtained in this thesis and in the paper by Qouta et al. (2012), it appears co-morbid depression is certainly no reason to exclude children from group interventions, though significant peritraumatic dissociation might be.

Looking at the existing and expanding literature on the subject, it is easy to agree with Peltonen and Punamäki (2010) in their conclusion that the main challenge today as regards preventive interventions for children exposed to war and armed conflict remains to fit the services provided to the needs of the traumatized children, tailoring age and context specific services. Tol et al. (2010) have also called for stronger separation between low-level universal prevention and more selective preventions directly targeted at reducing posttraumatic stress symptoms.

Traumatized children would certainly benefit from interventions that would be even more tailored and customized to their specific needs. The problem is, when resources in conflict-ridden environments are already stretched thin, and the practical arrangements for carrying out interventions often meet a plethora of obstacles, such tailoring and careful screening may not be possible. In such circumstances, more general, group-based interventions will end up being the practical, if sub-optimal, choice. With this fact in mind, it is at least comforting to note that such general interventions have increasingly been found to have real and sustained effects, even if the mechanisms of action of these interventions are still somewhat unclear.

An important point that cannot be overemphasized in the context of Gaza is the fact that the well-being of children exposed to war and conflict would be most strongly supported through the normalization of social conditions. As Peltonen and Punamäki (2010) note, individual-focused approaches may in some cases neglect alternative views of conceptualizing suffering as the result of political injustice felt collectively. Nowhere is this dynamic clearer than in Palestine. Permanent social reconstruction and healing can only happen when the political and military situation of the area improves. In the longer term, only the end of armed conflict and the establishment of a Palestinian state can lead to true normalization of social conditions, and may bring to an end to the

further traumatisation of children and adolescents in Palestine due to exposure to war and conflict. In the meantime, implementing psychosocial interventions such as TRT can help traumatized children. But as social reconstruction and adaptation are crucially important to the well-being of these children (Ager et al., 2011), we must be able to justify any interventions in terms of accelerating these processes, not just treating symptoms.

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